



US005543589A

**United States Patent** [19][11] **Patent Number:** **5,543,589****Buchana et al.**[45] **Date of Patent:** **Aug. 6, 1996**[54] **TOUCHPAD WITH DUAL SENSOR THAT SIMPLIFIES SCANNING**[75] Inventors: **William A. Buchana**, Scotland;  
**Richard A. Eardley**; **Anthony R. Tizzard**, all of Scotland, United Kingdom; **Brian G. Utley**, Boca Raton, Fla.[73] Assignee: **International Business Machines Corporation**, Armonk, N.Y.[21] Appl. No.: **247,730**[22] Filed: **May 23, 1994**[51] Int. Cl.<sup>6</sup> ..... **G08C 21/00**; G09G 3/02[52] U.S. Cl. .... **178/18**; 178/19; 178/20;  
345/173; 345/174; 345/175; 345/179[58] Field of Search ..... 178/18-20; 345/173-175,  
345/179[56] **References Cited****U.S. PATENT DOCUMENTS**

3,798,370	3/1974	Hurst	178/18
4,315,238	2/1982	Eventoff	338/99
4,455,450	6/1984	Margolin	178/18
4,463,232	7/1984	Takakuwa	200/159 B
4,529,959	7/1985	Ito et al.	178/18
4,570,149	2/1986	Thornburg et al.	178/20
4,638,118	1/1987	Wang	178/20

4,736,190	4/1988	Fiorella	345/179
4,908,612	3/1990	Bromley et al.	345/177
5,061,803	10/1991	Ambrose	361/398
5,149,918	9/1992	Kozik	178/18
5,159,159	10/1992	Asher	178/18
5,272,470	12/1993	Zetts	345/173
5,329,070	7/1994	Knowles	345/177

*Primary Examiner*—Stephen Chin*Assistant Examiner*—Vijay Shankar*Attorney, Agent, or Firm*—Anthony N. Magistrale[57] **ABSTRACT**

Disclosed is a dual sensor comprising first and second touchpad sensors having different resolutions and being sandwiched to form a single sensor. Each of the touchpad sensors include a first plurality of electrically conductive strips positioned proximate to a second plurality of electrically conductive strips. The conductive strips in each plurality lie substantially in a single plane and the two pluralities are skewed relative to one-another in plan view. The conductive strips are separated by insulators that extend beyond the surface of the conductors to separate the conductors of one plurality from the conductors of the other plurality until a localized pressure is applied to a region of the pad. Two such touchpad sensors are sandwiched to form the dual sensor of the present invention. The two touchpad sensors are configured and positioned such that a single touch of a finger, stylus, or the like is capable of being detected by both sensors.

**16 Claims, 23 Drawing Sheets**